

23d.—S. S. "Europa," in N. 44° 24', W. 45° 12' passed a large iceberg; s. s. "Greece," between N. 43° 0', W. 48° 50', and N. 42° 30', W. 51° 3', from 6 a. m. to 6 p. m., passed nine icebergs, some of which were very large.

24th.—Bark "Olbers," in N. 50° 36', W. 42° 22', passed an iceberg one hundred feet high.

25th.—S. S. "Nessmore," between the parallels of N. 42° 50' and N. 42° 10', and the meridians of 49° W. and 51° W., passed six icebergs, two of which were of very large dimensions.

26th.—S. S. "Tower Hill," in N. 43° 7', W. 49° 10' passed an iceberg; s. s. "Leerdam," in N. 42° 15', W. 51° 15', 5 p. m., passed several icebergs; s. s. "Republic," in N. 43° 40', W. 47° 53', at 8.30 a. m., passed a large iceberg about two hundred feet high; by 10 a. m. we had passed the last of nine others, scattered about north and south of the ship's course; at noon, in N. 43° 29', W. 49° 4', passed a quantity of broken field-ice. The s. s. "Neckar," in N. 42° 27', W. 49° 28', at 7.30 a. m. passed an iceberg about seventy feet high and 1,500 feet long; 10.30 a. m., in N. 42° 19', W. 50° 25', passed a large iceberg; 5.45 p. m., in N. 42° 6', W. 52° 17', passed another.

27th.—S. S. "Oder," at Bremen, reported having passed several icebergs in N. 41° 50', W. 51° 10'.

28th.—S. S. "Martello," in N. 42° 40', W. 50° 0', at 8 a. m., passed eight large icebergs; s. s. "Spain," between N. 44° 0', W. 48° 0' and N. 43° 13', W. 49° 10', passed four icebergs and a quantity of loose field-ice.

The following is taken from the advance sheets of the "International Nautical Magazine," published in New York:

HALIFAX, N. S., February 23, 1885.

To the publishers *International Nautical Magazine*:

DEAR SIR: The ice north of Sable Island, which comes out of the Gulf of Saint Lawrence, extends at present nearly from the Banks of Saint Peters to past the Straits of Canso and northward into the gulf.

On the previous voyage we passed through over one hundred miles of very heavy ice from latitude 45° 35', longitude 57° 20', to latitude 45° 20', longitude 59° 40', and we were jammed in it for twenty hours.

This voyage I took a more southerly course, and keeping south of latitude 45° 17', I passed through the southern edge of the ice, running through about eighty miles each way.

I have not, during the twelve winters I have run the mails to Newfoundland found such heavy ice so early in the localities mentioned until this season. The temperature of the water seems to be lower this spring than in many former years, and the ocean seems to be one congealed mass.

The Banks, south of Newfoundland and towards the coast of Nova Scotia, are full of what we term *slot ice*, and the sea from Cape Race to Belle Isle is full of heavy ice and icebergs.

I was this time detained two days, twelve hours through the ice blockade on the coast, and according to all accounts from incoming Dundee sealing steamers and other observations, *I firmly believe this will be a trying spring for ocean steamers and vessels in the north Atlantic trade*. It has been reported to me by the above-mentioned sealing steamers that the icebergs were uncountable.

Yours, respectfully,

CHARLES MYLIUS,  
Master, Mail Steamer "Newfoundland."

SIGNAL SERVICE AGENCIES.

Signal Service Agencies have been established in the Maritime Exchange Buildings at New York and Philadelphia, and in the Custom House at Boston, where the necessary blanks and other information will be furnished to ship-masters. In the January REVIEW was published an explanation of the object of these agencies.

In pursuance of the arrangements made with the Meteorological Office of London, England, there were, during February, 1885, ten reports cabled to that office, concerning storms and icebergs encountered by vessels on the Atlantic west of the forty-fifth meridian. Three messages were sent from Boston.

#### TEMPERATURE OF THE AIR.

[Expressed in degrees, Fahrenheit.]

The distribution of mean temperature over the United States and Canada for February, 1885, is exhibited on chart ii. by the dotted isothermal lines; and in the table of miscellaneous data are given the means for the various stations of the Signal Service.

In the following table are given the mean temperatures for

the several geographical districts with the normals and departures, as deduced from the Signal Service observations:

Average temperatures for February, 1885.

Districts.	Average for Feb. Signal-Service observations.		Comparison of Feb., 1885, with the average for several years.
	For several years.	For 1885.	
New England.....	28.6	20.4	- 8.2
Middle Atlantic states.....	36.3	27.7	- 8.6
South Atlantic states.....	50.6	43.8	- 6.8
Florida peninsula.....	64.2	59.1	- 5.1
Eastern Gulf states.....	53.4	46.0	- 7.4
Western Gulf states.....	52.8	46.5	- 6.3
Rio Grande valley.....	63.0	56.5	- 6.5
Tennessee.....	45.3	36.9	- 8.4
Ohio valley.....	36.8	24.8	-12.0
Lower lake region.....	28.0	16.0	-12.0
Upper lake region.....	21.0	9.4	-11.6
Extreme northwest.....	9.8	2.9	- 6.9
Upper Mississippi valley.....	29.3	18.1	-11.2
Missouri valley.....	22.3	14.0	- 8.3
Northern slope.....	21.3	22.7	+ 1.4
Middle slope.....	31.5	27.6	- 3.9
Southern slope.....	48.5	46.3	- 2.2
Southern plateau.....	45.7	46.5	+ 0.8
Middle plateau.....	32.9	38.2	+ 5.3
Northern plateau.....	29.2	39.2	+10.0
North Pacific coast region.....	40.4	30.7	- 9.7
Middle Pacific coast region.....	49.5	54.0	+ 4.5
South Pacific coast region.....	55.5	56.7	+ 1.2
Mount Washington, N. H.....	6.8	0.6	- 6.2
Pike's Peak, Colo.....	3.6	1.9	- 1.7

The mean temperature for February, 1885, was below the normal in all parts of the United States east of the one hundred and fifth meridian. In the lake region, upper Mississippi, lower Missouri and Ohio valleys the month was unusually cold, the mean temperature averaging from 10° to 15° below the normal. In the Ohio valley and Tennessee, along the Atlantic coast south of Massachusetts, and in the Gulf states the monthly mean temperatures were, with a few exceptions, the lowest recorded since the establishment of the Signal Service stations. At Cincinnati, Ohio, and Nashville, Tennessee, the mean temperatures for February, 1885, were 4° 2 and 4° 8, respectively, below that for February, 1875, which, in the northern districts east of the Rocky mountains, was the coldest February that has occurred since the Signal Service stations were established.

In the Rocky mountain districts and on the Pacific coast February, 1885, was warmer than the average, the departures above the normal temperature averaging from 2° to 10°.

#### RANGES OF TEMPERATURE.

The monthly and daily ranges of temperature at the various Signal Service stations are given in the table of miscellaneous meteorological data. The monthly ranges were greatest in the extreme northwest and least along the Pacific coast, the extremes being 90° 6 at Poplar River, Montana, and 22° 5 at San Francisco, California.

#### DEVIATIONS FROM MEAN TEMPERATURE.

The departures exhibited by the reports from the regular Signal Service stations are shown in the table of average temperatures for the various districts, in the table of miscellaneous data, and on chart iv. The following notes in connection with this subject are reported by voluntary observers:

*Arkansas*.—Lead Hill, Boone county: mean temperature, 32° 2, is 9° 5 below the February average for the three preceding years.

*California*.—Hydesville, Humboldt county: mean temperature, 50° 3, is 5° 9 above that for February, 1884, and is considerably above the average for the month for several years.

*Connecticut*.—Mr. W. W. Ellsworth, voluntary observer at Hartford, reports: "February was remarkable for its low mean temperature, which was 18° 0, or the lowest recorded for fifty years."

Mr. L. Andrews, at Southington reports: "Without exception this has been the coldest February for the last thirty

years; the next coldest February was that of 1875, the temperature being 18°.4, or 0°.9 above that for the present year."

**Dakota.**—Webster, Day county: mean temperature, 6°.8, is 1°.2 above the February average for the two preceding years.

**Georgia.**—Milledgeville, Baldwin county: mean temperature, 42°.4, is below the February normal; the coldest weather of the winter occurred on the 11th and 12th.

**Illinois.**—Mattoon, Coles county: mean temperature, 18°.3, is 15°.4 below the February average for the last five years.

Sycamore, DeKalb county: mean temperature, 8°.7, is the lowest recorded during the last four years.

Riley, McHenry county: mean temperature, 7°.7, is 14°.9 below the February average for the last twenty-four years, and is, with the exception of February, 1875, the lowest for that period.

Anna, Union county: mean temperature, 28°.0, is 11°.2 below the February average for the last ten years.

Swanwick, Perry county: mean temperature, 22°.2, is 14°.4 below the February average for the last three years.

Table of comparative minimum temperatures for the month of February.

State or Territory.	Minimum for February, 1885, Signal Service.		Minimum since Signal-Service stations were opened—3 to 14 years.			Lowest from any other source.			
	Station.	Temperature.	Station.	Temperature.	Year.	Place.	Temperature.	Year.	Length of record.
Alabama	Montgomery	15.5	Montgomery	22	1875	Huntsville	—7		Years.
Do	Mobile	24.0	Mobile	28	1875, 1876	Mount Vernon Arsenal	—13		32
Arizona	Prescott	14.3	Prescott	—11	1880	Fort Canby (old)	—12		12
Do	Fort Grant	25.3	Fort Grant	17	1883	Camp Grant	16		13
Arkansas	Fort Smith	1.0	Fort Smith	8	1883	Fort Smith	—4	1840	22
Do	Little Rock	10.2	Little Rock	22	1881, 1883	Washington (near)	6		28
California	San Francisco	46.5	San Francisco	35	1883	Fort Bidwell	—18	1868	19
Do	Sacramento	39.8	Sacramento	22	1883	Sacramento	31		17
Colorado	Denver	0.2	Denver	—20	1881	Fort Garland	—23		30
Do	Pike's Peak	—24.0	Pike's Peak	—37	1875	Fort Lewis	—36	1880	1
Connecticut	New London	2.0	New London	—3	1873	Colebrook	—28	1861	14
Do	New Haven	1.6	New Haven	—4	1881	New Haven	—16		86
Dakota	Fort Buford	—32.0	Fort Buford	—40	1883, 1884	Fort Abercrombie	—40	1861, 1869	16
Do	Yankton	—18.2	Yankton	—23	1881, 1884	Fort Pembina	—45	1875	1
Delaware	Delaware Breakwater	9.0	Delaware Breakwater	7	1881	Dover	—3	1875	6
Do						Fort Delaware	0		45
District of Columbia	Washington City	3.4	Washington City	—1.5	1875	Washington City	—5		49
Florida	Pensacola	24.0	Pensacola	31	1881	Fort Barrancas	11		58
Do	Key West	55.6	Key West	55	1877, 1878	Key West	45		44
Georgia	Augusta	14.7	Augusta	22	1875	Augusta Arsenal	—2	1835	31
Do	Savannah	22.5	Savannah	29	'75 '76 '81	Savannah	32		37
Idaho	Boise City	13.2	Boise City	—5	1882	Fort Hall	—13	1880	15
Do	Lewiston	23.0	Lewiston	—13.5	1883	Fort Boise	—10		1
Illinois	Chicago	—13.7	Chicago	—13	1875	Belvidere	—31.5	1875	5
Do	Cairo	0.6	Cairo	4	1875	Winnebago	—26		1
Indiana	Indianapolis	—9.0	Indianapolis	—8	1875	Spiceland	—21	1866	14
Do	Greencastle	—13.1				Vevay	—10	1867	21
Indian Territory	Fort Supply	1.0	Fort Sill	7	1881	Fort Arbuckle	—4	1856, 1857	49
Do			Fort Gibson	5	1875	Fort Gibson	—12		1
Iowa	Dubuque	—20.0	Dubuque	—31	1875	Guttenburg	—37	1868	5
Do	Davenport	—17.3	Davenport	—16	1875	Brookside	—35	1868	2
Kansas	Leavenworth	—16.2	Leavenworth	—12	1883	Fort Leavenworth	—26		56
Do	Dodge City	—5.2	Dodge City	—20	1883	Fort Riley	—18		2
Kentucky	Louisville	—1.3	Louisville	0	1875	Newport Barracks	—20		29
Louisiana	Shreveport	14.6	Shreveport	19	1884	Fort Jesup	7		3
Do	New Orleans	30.0	New Orleans	32.5	1875	New Orleans	26		51
Maine	Eastport	—10.6	Eastport	—20	1876	Brunswick	—28		24
Do	Portland	—4.8	Portland	—7	1874, 1876	Portland	—24	1826	37
Maryland	Baltimore	3.4	Baltimore	2	1873	Fort McHenry	—6	1875	50
Do	Ocean City	7.2				Deer Park	—10	1881	6
Massachusetts	Boston	0.8	Boston	—6.5	1870	Williamstown	—26		24
Do	Thatcher's Island	—1.3	Thatcher's Island	—9	1876	Lunenburg	—26		59
Michigan	Escanaba	—25.0	Escanaba	—32	1875	Fort Brady	—55	1875	35
Do	Detroit	—11.6	Detroit	—20	1875	Detroit	—14		18
Minnesota	Saint Vincent	—39.2	Saint Vincent	—38	1883	Fort Ripley	—43		55
Do	Saint Paul	—34.5	Saint Paul	—32	1875	Fort Snelling	—35		10
Mississippi	Vicksburg	17.2	Vicksburg	21	1875	Columbus	—25	1835	44
Do	Saint Louis	—5.5	Saint Louis	—3	1875	Saint Louis	—25	1872	13
Montana	Fort Assinaboine	—16.7	Fort Assinaboine	—47	1883	Fort Ellis	—53		4
Do	Fort Benton	—20.8	Fort Benton	—41	1883	Camp Baker	—43		13
Nebraska	Omaha	—17.9	Omaha	—24.9	1883	Fort McPherson	—24	1874	4
Do	North Platte	—22.2	North Platte	—29	1883	Camp Sheridan	—29	1881	13
Nevada	Winnemucca	10.3	Winnemucca	—17	1882	Fort Ruby	—19		5
New Hampshire	Mount Washington	—30.8	Mount Washington	—42	1876	Stratford	—37	1867	1
New Jersey	Sandy Hook	1.5	Sandy Hook	0	1881	Newark	—7	1861	14
Do	Atlantic City	5.0	Atlantic City	—5	1875	Paterson	—5		25
New Mexico	Santa Fe	12.0	Santa Fe	3	1879, 1880	Santa Fe	—5		20
Do	La Va	—12.0				Fort Union	—21	1881	8
New York	Buffalo	—12.8	Buffalo	—13	1875	Sackett's Harbor	—46	1861	29
Do	Albany	—10.0	Albany	—18	1881	Albany	—16		55
North Carolina	Charlotte	12.0	Charlotte	20	1881	Fort Johnson	3		58
Do	Fort Macon	18.3	Fort Macon	—1	1875	Fort Macon	20		16
Ohio	Cincinnati	—9.0	Cincinnati	—12	1875	Cincinnati	—17	1835	36
Do	Toledo	15.5	Toledo	—12	1875	Hillsborough	—22	1868	35
Oregon	Portland	31.5	Portland	7	1883	Camp Harney	—16	1868	72
Do	Roseburg	29.4	Roseburg	3	1884	Camp Warner	—3		7
Pennsylvania	Erie	—12.3	Erie	—15	1875	Philadelphia	—2		13
Do	Pittsburg	—8.8	Pittsburg	—4	1881	Allegheny Arsenal	—22	1856	32
Rhode Island	Block Island	6.6	Newport	—2	1881	Fort Adams	—15		33
Do	Narragansett Pier	0.0	New Shoreham	2	1881	Providence	—16		35
South Carolina	Charleston	22.0	Charleston	26	1881	Charleston	22		105
Do						Fort Moultrie	6		38
Tennessee	Nashville	9.9	Memphis	13	1875	Glenwood Cottage	—4		11
Do	Nashville	—0.8	Nashville	9	1875, 1876	Humboldt	11		4
Texas	Fort Elliott	—2.3	Fort Elliott	—10	1883	Fort McKavett	8		28
Do	Fort Stockton	11.2	Fort Stockton	8	1883	Camp Stockton	15		15
Utah	Salt Lake City	21.9	Salt Lake City	—13	1884	Fort Crittenden	—6		3
Vermont			Burlington	—18	1881	Randolph	—31	1868	5
Virginia	Norfolk	14.4	Norfolk	9	1875	Fortress Monroe	4		49
Do	Lynchburg	3.7	Lynchburg	—3	1875	Alexandria	3	1855	12
Washington Territory	Olympia	30.0	Olympia	8	1883	Fort Colville	—20		15
Do	Spokane Falls		Spokane Falls	—34	1884	Fort Walla Walla	—2		11
West Virginia			Morgantown	—10	1875	Helvetia	—6	1880	3
Wisconsin	La Crosse	—22.0	La Crosse	—34	1875	Fort Howard	—38	1823	31
Do	Milwaukee	—23.6	Milwaukee	—22	1875	Milwaukee	—18		11
Wyoming	Cheyenne	—12.5	Cheyenne	—28	1883, 1884	Fort Fetterman	—40	1873	6

**Indiana.**—Logansport, Cass county: mean temperature,  $18^{\circ}.1$ , is  $11^{\circ}.7$  below the February average for the last twenty-six years. The mean temperature for the winter of 1884-'85 is  $21^{\circ}.16$ , or  $6^{\circ}.59$  below the winter average for the above period.

Wabash, Wabash county: mean temperature,  $15^{\circ}.6$ , is  $19^{\circ}.3$  below the February average for the last nine years.

Vevay, Switzerland county: mean temperature,  $25^{\circ}.1$ , is  $10^{\circ}.8$  below the February average for a period of twenty-one years. The mean temperature for the winter of 1884-'85 is  $28^{\circ}.6$ , or  $4^{\circ}.7$  below the winter average for the period above named.

Spiceland, Henry county: mean temperature,  $17^{\circ}.6$ , is  $12^{\circ}.0$  below the February average for the last thirty-one years; during that period but one February was as cold as February, 1885. The mean temperature for the winter of 1884-'85 is  $21^{\circ}.6$ , or  $7^{\circ}$  below the winter mean for thirty-one years.

Sunman, Ripley county: mean temperature,  $22^{\circ}.0$ , is the lowest February mean recorded since 1843.

**Iowa.**—Cresco, Howard county: mean temperature,  $4^{\circ}.1$ , is the lowest February mean recorded since 1875.

Muscatine, Muscatine county: mean temperature,  $10^{\circ}.4$ , is  $14^{\circ}.0$  below the February average for the last forty-seven years, and is the lowest for that period with the exception of  $10^{\circ}.2$ , for February, 1875.

Monticello, Jones county, Iowa: mean temperature,  $8^{\circ}.7$ , is the lowest recorded in February since 1854, with one exception, viz.,  $7^{\circ}.5$  for February, 1875. The mean temperature for

the winter months (December—March) is  $10^{\circ}.1$ , or the lowest that has occurred during the period above mentioned.

**Kansas.**—Yates Centre, Woodson county: mean temperature,  $21^{\circ}.1$ , is  $9^{\circ}.8$  below the February average for the last five years. The mean temperature for the winter of 1884-'85 is  $20^{\circ}.5$ , or  $1^{\circ}.7$  below the winter average for the above period.

Lawrence, Douglas county: mean temperature,  $20^{\circ}.8$ , is  $12^{\circ}.1$  below the February average for the last seventeen years.

Wellington, Sumner county: mean temperature,  $24^{\circ}.6$ , is considerably below the February average for the last seven years.

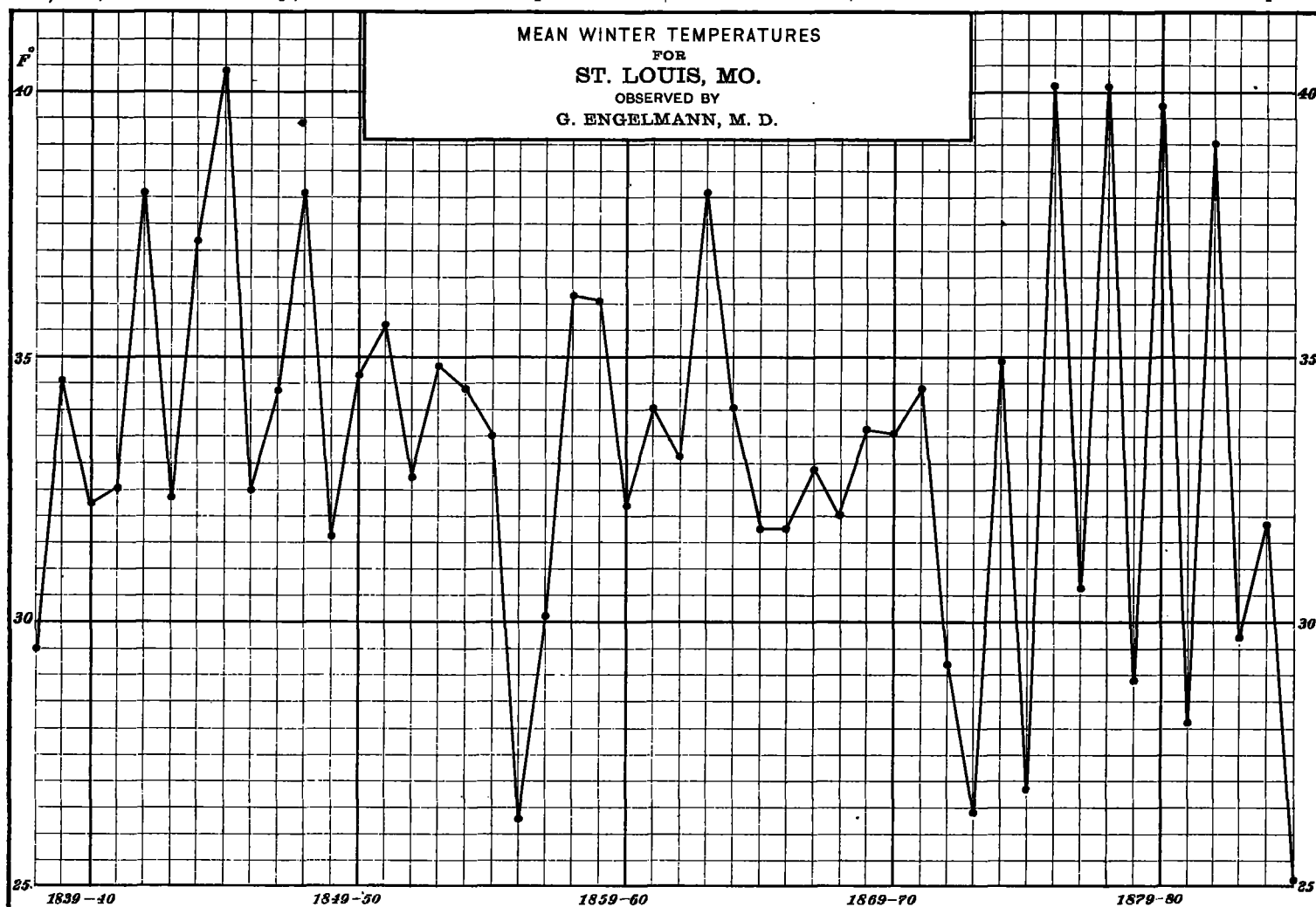
Atchison: mean temperature,  $18^{\circ}.7$ , is  $10^{\circ}.5$  below the February average for the last twenty-one years.

**Maryland.**—Fallston, Harford county: mean temperature,  $23^{\circ}.8$ , is  $8^{\circ}.9$  below the February average for the last fourteen years.

**Massachusetts.**—Worcester, Worcester county: mean temperature,  $16^{\circ}.0$ , is the lowest February mean recorded during the last forty-seven years; February, 1849, was the next coldest, the mean being  $18^{\circ}.1$ .

**Michigan.**—Thornville, Lapeer county: mean temperature,  $10^{\circ}.6$ , is  $14^{\circ}$  below the February normal.

**Missouri.**—The following diagram, showing the mean winter temperatures at Saint Louis, and the accompanying notes relative thereto are from the February report of "Missouri Weather Service," under the direction of Prof. F. E. Nipher:



The winter just past has been of unusual severity, not so much by reason of the very low temperatures reached as by reason of the long duration of cold weather.

The lowest temperature reached was  $-12^{\circ}$ , which has often been exceeded before. December had a temperature of  $29^{\circ}.8$ , which is  $3^{\circ}.7$  below the normal. The temperature of January was  $22^{\circ}.5$ , or  $8^{\circ}.9$  below the normal, while February, having a mean of  $23^{\circ}.1$ , was  $12^{\circ}$  below the normal. We have had

colder Decembers ten times since 1838, colder Januaries twice, and one February, that of 1837, was  $2^{\circ}.3$  colder than the past month.

The average for the winter was  $25^{\circ}.1$ , and this is  $1^{\circ}.2$  below any previous winter since 1837.

It would seem reasonable that an unusually cold winter should be followed by a cold and backward spring, but the observations do not aid us any in making predictions.

The coldest March on record (1843) having a temperature of  $27^{\circ}.4$  followed a winter only  $1^{\circ}$  below the normal.

In all, three cold Marches, two of which were the coldest, have followed normal winters, one has followed a very warm winter—one of the warmest observed, one has followed a cool winter, and two a cold winter. Our two warmest Marches have followed warm winters, three other warm Marches following normal winters.

For April the same thing can be said. The coldest April on record (1857), followed a cool winter, but the previous winter, one of the coldest on record, was followed by a mild and pleasant April.

It therefore, appears that the winter temperature of Saint Louis affords no criterion for predicting the character of succeeding months.

**New Hampshire.**—Contoocook, Merrimac county: mean temperature,  $13^{\circ}.5$ , is about  $9^{\circ}$  below the February average.

**New Jersey.**—Paterson, Passaic county: February, 1885, was a remarkably cold month; the daily mean temperature was above the freezing point on but three days.

South Orange, Essex county: mean temperature,  $22^{\circ}.8$ , is the lowest recorded in February during the last fifteen years, and is  $7^{\circ}$  below the normal for the same period.

**New York.**—Palermo, Oswego county: mean temperature,  $9^{\circ}.8$ , is  $11^{\circ}.7$  below the February average for the last thirty-two years, and is the lowest February mean for that period.

Cooperstown, Otsego county: mean temperature,  $10^{\circ}.5$ , is the lowest recorded for any month during the last thirty years, with the exception of January, 1857. The mean of the 7 a. m. observations is the lowest recorded for any month during the above period.

North Volney, Oswego county: mean temperature,  $12^{\circ}.4$ , is  $9^{\circ}.8$  below the February average for the last seventeen years, and is the lowest recorded during that period. The mean temperature for the winter of 1884-'85 is  $19^{\circ}.6$ , or  $3^{\circ}.6$  below the winter average for seventeen years.

**Ohio.**—Wauseon, Fulton county: mean temperature,  $11^{\circ}.9$ , is  $14^{\circ}.5$  below the February average for the last fifteen years.

**Pennsylvania.**—Dyberry, Wayne county: mean temperature,  $13^{\circ}.6$ , is  $8^{\circ}.9$  below the February average for the last twenty-one years, and is the lowest recorded in that period.

Grampian Hills, Clearfield county: mean temperature,  $13^{\circ}.7$ , is  $9^{\circ}.3$  below the February average for a period of eleven years—from 1865 to 1875.

Quakertown, Bucks county: mean temperature,  $19^{\circ}.8$ , is  $11^{\circ}.5$  below the February average for the last six years.

**Vermont.**—Woodstock, Windsor county: mean temperature,  $6^{\circ}.7$ , is  $10^{\circ}$  below the February average for the last eighteen years.

**Virginia.**—Variety Mills, Nelson county: mean temperature,  $29^{\circ}.6$ , is  $10^{\circ}.7$  below the February average for the last eight years, and is the lowest recorded during that period. The mean temperature for the winter of 1884-'85 is  $33^{\circ}.8$ , or  $3^{\circ}.5$  below the winter average for eight years.

Wytheville, Wythe county: mean temperature,  $30^{\circ}.0$ , is  $7^{\circ}$  below the February average for a period of seventeen years.

Bird's Nest, Northampton county: mean temperature,  $35^{\circ}.0$ , is with one exception, the lowest recorded during the last sixteen years.

**West Virginia.**—Helvetia, Randolph county: mean temperature,  $25^{\circ}.7$ , is  $11^{\circ}.1$  below the February average for the last nine years.

#### LOW TEMPERATURES.

Fort Totten, Dakota: the daily mean temperature for the 9th was  $-29^{\circ}.0$ , the lowest of the winter.

Dubuque, Iowa: the 10th was the coldest day of the winter, minimum temperature  $-13^{\circ}.6$ .

Leavenworth, Kansas: the minimum temperature on the 10th,  $-16^{\circ}.2$ , is the lowest of the season. Reports from the surrounding country state that the extremely cold weather has resulted in heavy loss of live stock.

New York City: on the 11th, the temperature fell to zero, being the lowest of the winter.

Chicago, Illinois: the minimum temperature,  $-13^{\circ}.7$ , on the 11th, is the lowest recorded in February since the establishment of this station.

Nashville, Tennessee: on the 20th, the temperature fell to  $2^{\circ}$ , which is the lowest recorded in February for many years.

Rochester, New York: at 7 a. m. on the 11th, the temperature was  $-10^{\circ}$ , and between 7 and 8 a. m., it fell to  $-11^{\circ}$ , which is within  $1^{\circ}$  of the lowest previously recorded at this station, viz.:  $-12^{\circ}$  on February 19th, 1875.

Moorhead, Minnesota: the 9th was the coldest day of the winter, the daily mean temperature being  $-25^{\circ}.1$ , and the minimum  $-30^{\circ}$ .

Columbus, Ohio: the minimum temperature on the 11th,  $-11^{\circ}$ , is, with the exception of  $-20^{\circ}$  on January 3d, 1879, the lowest recorded since this station was established in 1878.

Toledo, Ohio: the weather during the 10th and 11th was the coldest experienced for many years; the minimum temperature on the 11th was  $-15^{\circ}.5$ ; the lowest previously recorded at this station was  $-12^{\circ}$ , which occurred in both January and February of 1875.

Atlanta, Georgia: the minimum temperature,  $8^{\circ}$ , on the 11th, is the lowest of the winter.

Montgomery, Alabama: the lowest temperature of the season,  $15^{\circ}.5$ , occurred on the 11th.

Buffalo, New York: on the 11th the minimum temperature was  $-12^{\circ}.6$ ; the lowest temperature recorded since this station was established in 1871, is  $-13^{\circ}$  for February 9th, 1875.

Milwaukee, Wisconsin: the minimum temperature of the 11th was  $-23^{\circ}.6$ ; the lowest temperature recorded since the establishment of this station is  $-25^{\circ}$  for January, 1875. The winter of 1884-'85 has been unusually severe. The mean temperature for the months of December, January, and February, is lower than that for corresponding period since the station was established. At the close of February the earth was frozen to an average depth of five feet. The officers of the water department and plumbers, state that the ground froze to a greater depth than was ever before known. The general conditions of the past winter were similar to those of the winter of 1874-'75.

Port Huron, Michigan: on the 11th the temperature fell to  $-25^{\circ}$ , which is the lowest recorded here since 1864.

#### FROSTS.

Frosts occurred in the various districts on the following dates:

**New England.**—1st to 28th.

**Middle Atlantic states.**—1st to 28th.

**South Atlantic states.**—2d, 3d, 6th, 7th, 9th to 25th, 27th, 28th.

**Florida.**—Sanford, 3d, 7th, 12th, 17th, 20th; Cedar Keys, 20th, 21st; Saint Augustine, 7th, 17th, 20th, Archer, 2d, 3d, 7th, 11th, 12th, 20th; Mayport, 11th, 17th, 20th; Limona, 7th, 11th, 12th, 17th, 26th; Newport, 3d, 7th, 11th, 12th, 17th, 19th to 22d.

**Eastern Gulf states.**—2d, 3d, 6th, 7th, 10th to 24th, 26th, 27th, 28th.

**Western Gulf states.**—1st to 4th, 6th, 10th to 20th, 25th to 28th.

**Rio Grande valley.**—Rio Grande City and Brownsville, Texas, 14th.

**Tennessee.**—1st, 2d, 10th, 11th, 12th, 14th to 28th.

**Ohio valley.**—3d, 4th, 10th, 11th, 12th, 14th, 15th, 18th to 24th, 27th, 28th.

**Lower lake region.**—1st, 4th, 5th, 6th, 10th to 28th.

**Upper lake region.**—1st to 28th.

**Extreme northwest.**—1st to 28th.

**Upper Mississippi valley.**—3d, 11th to 14th; 20th to 23d, 25th to 28th.

**Missouri valley.**—1st to 28th.

**Northern slope.**—1st to 28th.

**Middle slope.**—1st to 4th, 7th to 28th.

**Southern slope.**—1st, 2d, 10th, 11th, 12th, 14th, 25th.

**Southern plateau.**—1st to 21st, 25th to 28th.

**Middle plateau.**—1st, 2d, 3d, 8th, 9th, 12th, 13th, 15th, 22d to 25th, 27th, 28th.

**Northern plateau.**—7th, 8th, 12th, 14th, 22d to 25th, 28th.

*North Pacific coast region.*—7th, 17th, 21st, 22d, 23d, 27th, 28th.  
*Middle Pacific coast region.*—7th to 17th, 22d to 28th.  
*South Pacific coast region.*—San Diego, California, 10th.

## ICE.

Ice formed in the southern parts of the country as follows:

*Arizona.*—Wickenburg, 9th, 15th.

*Florida.*—Jacksonville, 11th.

*Georgia.*—Savannah, 11th, 21st; Athens, 10th to 24th; Augusta, 12th.

*Louisiana.*—Liberty Hill, 10th.

*North Carolina.*—Fort Macon, 11th, 19th, 20th, 21st; Portsmouth, 20th, 21st, 22d; Kitty Hawk, 11th, 19th, 21st, 22d; New River Inlet, 17th, 19th to 23d.

*Texas.*—Galveston, 10th; Indianola, 10th, 14th.

## PRECIPITATION.

[Expressed in inches and hundredths.]

The distribution of rainfall over the United States and Canada, for the month of February, 1885, as determined from reports from more than seven hundred stations, is exhibited on chart iii.

In the northern and middle Rocky mountain districts, the Rio Grande valley, and Florida peninsula the precipitation for February was in excess of the average, the departures being slight except in Florida peninsula where they were more than three inches above the average. The most important feature in connection with the monthly precipitation is the large area of deficiencies which, with exception of a few isolated localities, includes nearly all districts east of the Rocky mountains. The deficiencies are most marked in California, the lower lake region, upper Mississippi and Missouri valleys, Tennessee and the Gulf states. In northern California where the February average for several years is about four inches, this year it is but little more than one-half inch, and in southern California there was an almost entire absence of rain, the average for February in former years being about two and one-half inches.

Owing to large deficiencies in the February precipitation in the central valleys, and the prevalence of unusually low temperatures, which prevented a sudden melting of the winter snowfall, a repetition of the destructive floods of February, 1883 and 1884, have not occurred.

In the following table are shown, for each of the geographical districts, as deduced from Signal Service observations, the average February precipitation for a series of years; the average for February, 1885, and the departures from the normal.

Average precipitation for February, 1885.

Districts.	Average for Feb. Signal-Service ob- servations.		Comparison of Feb., 1885, with the av- erage for sev- eral years.
	For sev- eral years.	For 1885.	
	<i>Inches.</i>	<i>Inches</i>	<i>Inches.</i>
New England.....	4.06	3.12	—0.94
Middle Atlantic states .....	3.50	3.28	—0.22
South Atlantic states .....	3.94	3.80	—0.14
Florida peninsula.....	2.63	6.11	+3.48
Eastern Gulf states .....	5.11	3.38	—1.73
Western Gulf states .....	4.31	2.56	—1.75
Rio Grande valley .....	1.38	1.82	+0.44
Tennessee.....	5.69	2.46	—3.23
Ohio valley.....	4.01	2.14	—1.87
Lower lake region .....	2.72	1.27	—1.45
Upper lake region.....	1.97	1.53	—0.44
Extreme northwest.....	0.71	0.26	—0.45
Upper Mississippi valley .....	2.48	0.81	—1.67
Missouri valley.....	0.90	0.44	—0.46
Northern slope.....	0.51	0.94	+0.43
Middle slope .....	0.42	0.51	+0.09
Southern slope.....	0.66	0.53	—0.13
Southern plateau .....	1.14	0.62	—0.52
Middle plateau.....	1.31	1.48	+0.17
Northern plateau.....	2.68	2.80	+0.12
North Pacific coast region.....	7.45	6.56	—0.89
Middle Pacific coast region.....	4.75	0.66	—3.45
South Pacific coast region.....	2.52	0.08	—2.44
Mount Washington, N. H.....	4.15	1.87	—2.28
Pike's Peak, Colo.....	1.61	3.91	+2.30

Table of excessive, and greatest monthly precipitation—February, 1885.

Station.	Specially heavy.		Largest monthly. Amount.	Station.	Specially heavy.		Largest monthly. Amount.
	Date.	Amt.			Date.	Amt.	
<i>Alabama.</i>				<i>New Jersey.</i>			
Newton.....	9	2.00	6.25	Paterson.....	8, 9	2.23	.....
Do.....	25	2.75	.....	<i>New York.</i>			
<i>California.</i>				New York City.....	9, 10	2.62	6.09
Fort Gaston.....			6.26	David's Island.....	9	2.10	.....
<i>Connecticut.</i>				Fort Hamilton.....	9	2.06	.....
Bethel.....	9	2.00	.....	Fort Columbus.....	9, 10	2.08	.....
Southington.....	9, 10	2.10	.....	White Plains.....	9	2.00	.....
Hartford.....	9, 10	2.10	.....	Do.....	17, 18	2.65	.....
New London.....	9, 10	2.05	.....	<i>North Carolina.</i>			
New Haven.....	9, 10	2.10	.....	Kitty Hawk.....	6	2.10	6.17
<i>Florida.</i>				Brevard.....	8, 9	2.05	.....
Cedar Keys.....	13, 14	2.88	9.02	<i>Oregon.</i>			
Do.....	25	3.27	.....	Bandon.....	2, 3	3.09	12.42
Newport.....	8, 9	2.95	7.13	Do.....	16, 17	2.48	.....
Do.....	24, 25	2.52	.....	Astoria.....	18, 19	2.60	10.59
Archer.....			6.90	Do.....	25, 26	2.22	.....
Saint Augustine.....	12, 13	3.21	.....	Eola.....			7.06
Fort Barrancas.....	24	3.10	.....	Portland.....			6.72
Sanford.....	13, 14	2.37	.....	East Portland.....			6.08
Jacksonville.....	13, 14	2.20	.....	<i>Pennsylvania.</i>			
Pensacola.....	24	2.33	.....	West Chester.....	15, 16	2.05	6.39
Limona.....	12	2.20	.....	South Bethlehem.....	16	2.29	6.23
<i>Georgia.</i>				Haverford Col- lege.....	16	2.05	.....
Gainesville.....			6.20	<i>Rhode Island.</i>			
<i>Louisiana.</i>				Nyatt Point.....	16	2.00	.....
Shreveport.....	23, 24	2.19	.....	<i>Texas.</i>			
<i>Maine.</i>				Palestine.....	23	2.44	.....
Gardiner.....	10	3.25	6.44	<i>Washington Ter.</i>			
Portland.....	10	2.95	.....	Neah Bay.....	12, 13	4.40	18.50
Orono.....	9, 10	2.20	.....	Do.....	18, 19	3.35	.....
<i>Maryland.</i>				Do.....	24, 25	2.75	.....
Great Falls.....	10	2.10	.....	Tatoosh Island.....	1, 2, 3	3.66	13.28
<i>Massachusetts.</i>				Do.....	18, 19	2.75	.....
Wood's Holl.....			6.06	Do.....	24, 25	2.17	.....
Amherst.....	9, 10	2.12	.....	Pysht.....	1 to 4	5.23	12.37
Leicester.....	9, 10	2.07	.....	Do.....	18, 19	2.07	.....
Westborough.....	9, 10	2.56	.....	Fort Canby.....	18, 19	2.32	11.20
Rowe.....	16	2.00	.....	Do.....	25, 26	3.09	.....
Worcester.....	8, 9	2.15	.....	Olympia.....	3, 4	2.45	7.67
<i>Mississippi.</i>							
Vicksburg.....	24	2.24	.....				

## DEVIATIONS FROM AVERAGE PRECIPITATION.

The departures exhibited by reports from the regular Signal Service stations are shown in the table of average precipitation for the several districts and in the table of miscellaneous meteorological data. The following notes in connection with this subject are reported by voluntary observers:

*Arkansas.*—Lead Hill, Boone county: monthly precipitation, 1.47, is 7.89 below the February average for the three preceding years.

*Dakota.*—Webster, Day county: precipitation for the month was inappreciable, the February average for the two preceding years being 4.82.

*Illinois.*—Mattoon, Coles county: monthly precipitation, 0.65, is 6.00 below the February average for the last five years.

Sycamore, DeKalb county: monthly precipitation, 1.55, is 1.23 below the February average for the last three years.

Riley, McHenry county: monthly precipitation, 1.92, is 0.27 in excess of the February average for the last twenty-two years.

Anna, Union county: monthly precipitation, 1.22, is 3.01 below the February average for the last ten years.

Swanwick, Perry county: monthly precipitation, 0.66, is 6.01 below the February average the three preceding years.

*Indiana.*—Logansport, Cass county: monthly precipitation, 4.10, is 1.26 above the February average for the last twenty-six years.

Wabash, Wabash county: monthly precipitation, 1.26, is 2.12 below the February average for the last nine years. The monthly snowfall for January and February, 34.3 inches, is the largest that has occurred for many years.

Vevay, Switzerland county: monthly precipitation, 2.46, is 1.30 below the February average for the last twenty-one years. The snowfall, 9.1 inches, exceeds the February average by 5.3 inches, and has been greater in February but once in the above period, viz: 11.8 inches in 1867.

Spiceland, Henry county: monthly precipitation, 1.53, is 1.05 below the February average for the last thirty-one years. The snowfall, 10.8 inches, is 5 inches in excess of the February average.